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COMMONWEALTH of VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY

June 21, 1994

Commander
Atlantic Division
Naval Facilities Engineering Command
1510 Gilbert Street
Attn: Code 1822, Mr. Jim Harris
Norfolk, Virginia 23511-2699

RE: Final Remedial Investigation, Q Area Drum Storage Yard, Norfolk Naval Base
Final Feasibility Study, Q Area Drum Storage Yard, Norfolk Naval Base

Dear Mr. Harris:

The Virginia Department of Environmental Quality is in receipt of the documents entitled, "Final Remedial Investigation, Q Area Drum Storage Yard, Norfolk Naval Base, Norfolk, Virginia," and "Final Feasibility Study, Q Area Drum Storage Yard, Norfolk Naval Base, Norfolk, Virginia," both dated April, 1994. Questions and comments related to review of these documents are attached. Review by Ms. Patricia McMurray, Superfund Toxicologist, is still pending. You should receive her comments by mid-July.

If you have any questions, please feel free to contact me at (804) 762-4205.

Sincerely,

Lisa A. Ellis
Remedial Project Engineer
Federal Facilities Program

Attachments *to Rob Thomson, EPA Region III*

cc: Rob Thomson, EPA Region III
Dave Forsythe, Norfolk Naval Base
K.C. Das
Patricia McMurray

**Comments
Norfolk Naval Base
Q Area Drum Storage Yard
Draft Remedial Investigation Report
Draft Feasibility Study Report**

REMEDIAL INVESTIGATION REPORT

General Comments

- R1. The reports are entitled "Final Remedial Investigation" and "Final Feasibility Study." Due to the lag time between the draft and final reports, as well as the fact that additional data was obtained in 1993 that was not present in the original draft, these reports cannot be regarded as final reports, rather as second drafts. 55
- R2. The document was reviewed by the Chesapeake Bay Local Assistance Department for consistency with the Chesapeake Bay Preservation Area (CBPA) Ordinance adopted by the City of Norfolk. Norfolk is one of several cities to integrate their CBPA program with the requirements for the EPA stormwater discharge permit under the NPDES program. In doing so, the City has applied the general performance standards required under the Chesapeake Bay Preservation Area Designation and Management Regulations (VR 173-02-01) city-wide. These standards pertain to the minimization of land disturbance, preservation of indigenous vegetation, following the local erosion and sediment control ordinance for projects disturbing more than 2,500 square feet and stormwater management. Although this project is not located within the City's formal CBPA, the city-wide performance standards will apply. Any of the remedial action alternatives involving land disturbance should be consistent with the erosion and sediment control standards. In addition, Alternative 2, which would involve the placement of an asphalt cap, should meet the stormwater management standard. Since the study area is currently covered by gravel, Alternative 2 would be classified as "redevelopment." Redevelopment projects should provide a 10% reduction of non-point source pollution in runoff compared to the existing runoff load from the site. The 10% reduction can be achieved either through the use of structural Best Management Practices or by revegetating portions of the study area that were previously covered by gravel.
- R3. There is no information within the Remedial Investigation stating when the last drums were removed from the site; however, no drums were present at the time of the TRC meeting in May. Please include this in the site history section.
- R4. On page 1 of the Executive Summary, it is indicated that the QADSY area was created from a dredged material filling operation. It should be noted that the potential exists for the dredged material to have contained elevated levels of contaminants, and "background" for the site, if established from the dredge-fill area, will have elevated levels of contaminants.

Mr. Harris

Q Drum Storage RI/FS Comments

Page 2

- R5. Throughout the document, such as pages 1 and 2 of the Executive Summary, TCLP metals levels are referenced. TCLP levels should only be used to determine characterization of waste for disposal purposes, not contaminant levels present in soil and other media.
- R6. Are there any records in existence to document what materials, both raw and waste, have historically been stored at the QADSY? This information ^{will} be useful to determine what types of analyses should be performed at the QADSY, and should be included in the report.
- R7. On page 2 of the Executive Summary, a background surface water sample for the Elizabeth River is referenced. What was the time of day of this sampling event? Tidal activity will affect contaminant levels in the surface water.
- R8. It is noted that the drum storage area is divided into three general area^s: Hazardous Materials, Petroleum Products and Transit Area. Each area has been sampled separately and treated as distinct units. However, it should be noted that it is highly likely that any contamination resulting from each of the areas significantly impacts the others in light of the proximity of the sites to a tidally influenced waterway.
- R9. A removal action in 1987 is cited on page 1-4 of the report. DEQ's Federal Facilities Program did not exist at that time, and does not have any copies of the documentation of the removal action. ~~Please provide copies of any correspondence/reports related to this activity.~~ What was done with the soil that was removed? Was it disposed at an on-site landfill, or properly disposed off-site at a permitted hazardous waste landfill?
- R10. The title of Figure 1-5 is misleading. The figure is dated 6-4-91 and is entitled "Area Recommended for Contaminated Soil Removal." However, the removal action took place in 1987. It would be more appropriately entitled "Area of contaminated soil removed during 1987 removal action."
- R11. It would be helpful if Tables and figures were located immediately after the page in which they were referenced, which would make the document easier to follow.
- R12. On page 2-2, the surface soil investigation description begins. The description on page 2-3 of the number of samples and analyses performed is confusing. It is unclear if there are 24 or 36 borings. How were the analyses performed on a given number of samples determined? The soil analysis summary provided in Table 2-2 could not clarify these issues. Also, it ~~does not appear that~~ total metals levels were analyzed for. If so, ~~the area has not fully been characterized.~~

- R13. As indicated on page 2-7, why was the background surface water sample analyzed only for metals?
- R14. The abbreviation "PP" in the report is used both for priority pollutants (executive summary page 2, page 5-12, etc.) as well as the Petroleum Products area (throughout). This is confusing. Different abbreviations should be used.
- R15. An list of acronyms used in the document would be helpful.
- R16. Page 3-5 states that the Yorktown aquifer in the area of the site is only used for lawn irrigation. This could result in dermal contact. This route of exposure should be discussed within the Baseline Risk Assessment.
- R17. It is stated that the Virginia Department of Health currently restricts use of the Columbia (water table) aquifer as a potable source of water. There is no confining layer between the Columbia and Yorktown aquifer at the site, and the Yorktown aquifer apparently has no restrictions. Is it possible that there could be future potable use of the Yorktown (either on or off site) which would be impacted by contaminants on the site.
- R18. In Section 5.1, on page 5-1, it is stated that the site was broken down into five distinct parcels based on the historical use of each area, including HM, PP, TA and EY. What was the Fleet Parking (FP) area not investigated?
- R19. Several references in the document, such as at the bottom of page 5-1, compare contaminant levels to EPA Region III concentrations. This reference is misleading, and should more accurately be cited as RBC levels.
- R20. On page 5-3, reference is again made non-detection of TCLP constituents. As stated previously, TCLP analysis is only useable for characterization for disposal, not characterization of contaminant levels for clean up purposes.
- R21. In section 5.1.1.5, numerous references are made to "below the federal standard". Please be specific what citing standards. To which standard do these references refer? A full citation of the law, date, etc. should be provided.
- R22. On page 5-11, it is stated that "two site areas appear to have metals levels that are marginally higher than those noted in the background samples and apparently non-contaminated samples from other site areas." This is an erroneous statement in that only TCLP metals have been considered, not total metals levels. Also, the presence of an acceptable background sampling location in an area which was created from dredged materials does not seem feasible.

- R23. A residential scenario should be evaluated in the baseline risk assessment if there is any possibility for residential development in the future. Please provide justification for the use of Region III risk-based concentrations for industrial soil as opposed to residential soil.
- R24. Please include a table within the document listing the analytical methods used.
- R25. The "Baseline Risk Assessment" section states that "dilution and dispersion of contaminants in both groundwater and the receiving water body will reduce concentrations at the subsequent point of exposure." Dilution and dispersion can not be used as arguments to discount exceedances of surface water standards.
- R26. If aquifer reinjection is to be considered as a viable alternative, the Water Division should be consulted.
- R27. Figures 5-2 and 5-3 do not give an explanation for the symbol that represents the monitoring wells in the figure.
- R28. Figure 5-20, the Iso-concentration Plot for Acetone for the 20-25 foot interval, contains values for acetone that have not been contoured as a part of the plot.
- R29. Figure 5-22 does not show the lithology that is associated with the respective subsurface of the area. Inclusion of this information would be helpful.
- R30. On page 7-3, it is stated that "the risk assessment units of various regulatory agencies have specifically stated that it is not appropriate to conduct a risk assessment with TPH data." The presence of concentrations of TPH of 100 ppm or greater warrants an assessment of risk. While risk assessment cannot be conducted on TPH per se, this class of compounds can be broken down into its constituents: benzene, toluene, ethylbenzene, and xylene. If you were to use the risk associated with benzene to characterize the worst case scenario for impact to human health at this site, reference to the EPA Region III Risk-Based Concentration (RBC) Table, dated March 18, 1994, shows that the acceptable concentrations of benzene in commercial/industrial soils is 99 ppm and 22 ppm in residential soils.
- R31. Throughout the document, references to ARARs should cite the most recent publication, not the publication in effect when this RI was in its first draft. This includes the references to EPA Region III RBC tables.
- R32. On pages 7-6 and 7-10, it is stated that a rigorous review was not conducted on the toxicity of chemicals of potential concern. Why wasn't this done? This information must be included in the Baseline Risk Assessment.

- R33. On pages 7-6 and 7-7, it is stated that because chemical concentrations in air could not be calculated without further information, reference concentrations are not useful for risk characterization. This is not acceptable. If additional data is required, this data should be obtained. Evaluation of the inhalation exposure pathway is an intrinsic and necessary portion of the Baseline Risk Assessment.
- R34. It is indicated on page 7-8 under Direct Contact that for the chemicals where a RCRA criteria exists, no value is exceeded. There are no RCRA action levels. There are proposed Corrective Action cleanup levels, but these have not yet been promulgated. To what do these action levels refer?
- R35. It is stated on page 7-11 that for humans, it was determined that direct contact with chemicals in soil was of low probability. How was this probability calculated?
- R36. It is noted on page 7-14 that the risk for each constituent is evaluated by area. The QADSY site should be evaluated in total, not by area, for a total risk level.
- R37. It would have significantly reduced review time if the contaminants listed in Table 7-1 were in alphabetical order.
- R38. Many of the values listed in Table 7-2 are qualified in the original Ambient Water Criteria summary document. These qualifiers should be duplicated in Table 7-2.
- R39. Table 7-2 qualifier "b" is listed as "VDEQ". This is an inadequate citation.
- R40. ESE concluded that there is a net negative influence of the tide on the ground water at this area; therefore, tidal effects on-site were ignored. However, based on the graphs illustrated in Figures 4-6 through 4-9, there is an obvious tidal influence on the static water levels in SW-1, SW-2, SW-4, SW-5, SW-6, and SW-8. In addition, there is an obvious lag time between the high/low tides and high/low static water levels, which is obviously caused by distance and time between the body of water (Elizabeth River) and the wells. Since daily tidal effects influence the static water levels in the above-mentioned wells, reevaluation of the fate & transport model and the risk assessment should be performed. Tidal influences may alter the flow direction, dispersion factors, volatilization rates, diffusion rates, octanol/water partition coefficients, etc. in the ground water and soil models.
- R41. Please note that the magnitudes of tides should always be greater than the crests and troughs of static water levels in the wells since tidal dispersion, distance, and time must be considered.

- R42. The report neglects to mention and discuss the strong northeast groundwater trend towards Willoughby Bay exhibited in the INTERTRANS Model (Figures 4-20 and 4-21), since some of the isoconcentration maps in Section 5 show that the contaminant plumes are moving to the northeast.
- R43. In addition to ground water modeling, identification of all subsurface conduits is necessary in order to fully evaluate potential shallow groundwater migration routes beneath the site.
- R44. Figure 4-8 has Static Water Table and Average Water Elevation delineated incorrectly.
- R45. The time of day relative to the tides of groundwater sampling was not discussed in the report. In order to collect the most representative groundwater samples in a tidally influenced area, sampling should occur during low tide.
- R46. Please note that the summary section of the RI and the FS report will have to be modified based on any changes made in accordance with the comments contained herein.

Air Comments - Summary (Doris McLeod, Toxics Engineer; Ken McBee, Manager, Modeling Section)

- R47. If an air contamination source is unsure about whether or not there might be air requirements, for NPL sites, or the need for an air permit for non-NPL sites, the source is urged to complete an air permit application and submit it to the appropriate regional air permitting office, in this case the Chesapeake Air Office. A source submitting an application that is deemed to be exempt by the air permitting staff will receive an exemption letter from the region. A source not meeting air requirements and/or not having a permit to construct and operate may be subject to large fines and other enforcement actions.

Applicability of the Virginia air regulations is generally based upon "maximum uncontrolled emission rate." Therefore, the permit engineer will need an estimate of the hourly and annual controlled and maximum uncontrolled emission rates of volatile organic compounds (VOC), particulate matter (PM), and toxic air pollutants during the entire remediation process. If the maximum uncontrolled VOC, PM, and toxic pollutant emissions are below Appendix R, Section IV and IX of the Virginia Regulations for the Control and Abatement of Air Pollution, the source may not need a permit.

If the amount of VOC or PM emitted is above the exemption levels in Appendix R, the source would be subject to the permitting requirements in Part 8 of the Regulations. As such, the source would be required to use either Best Available Control Technology (Rule 120-05-0403) or achieve the Lowest Achievable Emission Rate (Rule 120-05-04040), depending upon the potential emissions and the source location. If any

of the toxic compounds are above the hourly or yearly mass emission exemption rates, then the source must demonstrate that the emissions do not exceed the Significant Ambient Air Concentration (SAAC) for that pollutant (Rule 120-05-03). Normally, the permit engineer will use an air dispersion model to help make this determination. To perform these analyses, the permit engineer will need site-specific information including a site plan with building dimensions, stack parameters, discharge rates, discharge temperatures, fuel usage, concentration of pollutants in the selected remediation technique's effluent, destruction efficiencies of any control equipment, and a description of dust control methods. The source will be asked to fill out a permit application form (Forms 7, see enclosure 1) with attachments. The following list summarizes the basic information in their permit application. The permit engineer needs this information to decide whether a permit would be issued and what sort of permit conditions would apply:

- (1) Type of equipment used during the remediation project; e.g. Low Temperature Thermal Desorption Units, Incinerator, etc.
- (2) Length of time in which the remediation will take place;
- (3) Amount of each type of pollutant that could be emitted (potential to emit) and documentation supporting these calculations, including any estimates of the total amount of contaminants in soil;
- (4) Stack information for all point sources, including: Concentrations of pollutants emitted from stack; Stack dimensions; and Effluent flow rates and temperatures;
- (5) Identification of fugitive sources;
- (6) Quantification of potential emissions from fugitive sources.

While "volatile" and semi-volatile" are generally defined differently in chemical texts, air regulations do not make a distinction between the two. Enclosure 2 is a copy of the definition of volatile organic compounds from our regulations. Since just about all organics have some photochemical reactivity, any organic that is not specifically listed as exempt is considered to be a VOC unless a source can prove that the compound is not photochemically reactive. Another point to note is the comment made on page 12-30 that "Volatilization rates are expected to be below the Virginia Air Control Board rate of 4 pounds per hour." It is unclear from what source this number was derived. The Appendix R exemption limit is 25 tons VOC/year. If a source operates 8,760 hours in a year, the hourly rate is about 5.7 pounds VOC/hour. However, the yearly emission rate in tons of VOC, not the hourly emission rate, would be used to decide whether or not a permit would be issued.

Page 7-15 compares the modelled ambient concentrations of toxic chemicals to the state air toxics regulations. The study states, "Virginia Air Pollution Regulations are based on 1/100th of the ACGIH TLV's." Based upon this statement, it appears the consultant may be using regulations dating before 1991. The Virginia Air Toxic Regulations have been updated considerably, and the above quote is no longer true. The exemption formulas listed in Section IX of Appendix R vary depending on whether or not a pollutant has been assigned a TLV-C, TLV-STEL, and/or a TLV-TWA. Enclosure

3 is a copy of 120-05-03, the new source air toxic regulations, and AQP-5, the policy dealing with air toxics. Enclosure 4 is a copy of Appendix R, Stationary Source Permit Exemption Levels.

While the Remedial Investigation used the correct air model, the RI for the QADSY did not present an adequate analysis of air emissions. Using the emission rates in Table 7-8, the source did not model over the Significant Ambient Air Concentrations (SAAC) for any of the pollutants. Errors in Tables 7-8 and 7-9 prevented the Modeling Section of DEQ's Air Division from determining the SAAC's for 1,2-dichloroethene or 1,1-dichloroethane. The contractor used outdated air regulations and did not properly apply the definition of "volatile organic compound" found in the air regulations. Because of this, several compounds that were classed as "semi-volatiles" should be classified as "volatile organic compounds" and will need to be examined in more detail, depending upon the type of remediation action that will be used. The assumptions used in the model are not as representative of actual conditions as they should and could be. The remediation report assumed a source height of 1 meter and an area source dimension of 1 meter. Generally, remediation sites have piles of soil much larger than 1 m³, and they generally have more than one pile of soil.

If on-site Low Temperature Thermal Desorption or soil incineration is selected as the remedial alternative, it is recommended that an air permit application (Form 7) be completed and submitted to the Tidewater Air Office.

The analysis conducted by the Air Division Office of Permit Evaluation consisted of the following:

For the analysis, the model SCREEN2 was selected. Because the source area is an area source, the model chosen was considered appropriate. The following parameters were inputs to the model: Source Height = 1 meter; Area source dimensions = 1 meter; Emission rate = 1 gram/section. This emission rate was selected because a number of pollutants were involved. The resulting impact of each pollutant was then calculated by multiplying the emission rates of that pollutant by the concentration predicted using the 1 g/s. The emission rates were obtained from Column 4 of Table 7-8 of the QADSY RI report.

Receptors were placed every 100 meters from 100 meters to 3000 meters downwind of the emission source. However, according to the report, the nearest off-site receptor was located 1.5 miles, or approximately 2500 meters from the remediation site. Use of the 1 g/s emission rate resulted in an impact of 167.1 ug/m³ at this receptor. As stated in the previous paragraph, this figure was then multiplied by the emission rate for each pollutant listed in Table 7-8. A summary of the impacts at the 2500 meter receptor are summarized in Enclosure 5.

It should be emphasized that it was not possible to verify some of the model input data. This includes the assumption that the nearest off-site receptor distance is 2500 meters. Given this, OPE revisited the results of the SCREEN2 analysis to find where the highest impact occurred regardless of location and what that impact was. This receptor was located 100 meters away, and the predicted concentration was 30640

ug/m³. Even with this impact it has been shown that no exceedance of any applicable SAAC is predicted. Enclosure 6 summarizes this portion of the analysis. Please note that due to errors in Tables 7-8 and 7-9 of the QADSY report, impacts could not be determined for 1,2-dichloroethene or 1,1-dichloroethane.

Feasibility Study Report

- F1. As the conclusions drawn from the RI report are not necessarily correct or complete at this point in time, the FS will need to be modified following revision of the RI. Of specific concern is the RI conclusion that soil does not pose a risk to human health.
- F2. As was discussed during the Technical Review Committee meeting in May, because of the nature of the release in the QADSY, the soil and groundwater, when remediated, will meet the definition of hazardous waste following generation. For releases of unused commercial product, certain U-listings will apply. If releases of used material also took place, F-listings may also apply. I have confirmed this point with Ms. Leslie Romanchik of the Hazardous Waste Permitting Program. This means that any treatment of hazardous wastes on-site, with the possible exception of wastewater treatment in tank-like units followed by permitted discharge, or treatment within containers or tanks during the 90 day generator accumulation period, or in-situ treatment in which case the waste is never generated, will require a hazardous waste treatment permit in accordance with the Virginia Hazardous Waste Management Regulations. Accumulation of the hazardous waste in containers or tanks for greater than 90 days will require a hazardous waste storage permit. The hazardous waste may not be stockpiled during remediation (creation of hazardous waste piles subject to enforcement and closure requirements). Additionally, the RCRA Land Disposal Restriction (LDR) requirements will also apply, in addition to the other hazardous waste management requirements found in the Virginia Hazardous Waste Management Regulations. As you can see, the requirements and costs for managing hazardous wastes generated during the remediation will be substantial. A major revision of the Feasibility Study will be necessary in order to take into account generation, management and treatment/disposal of hazardous waste. If you wish, in order to facilitate revision of the Feasibility Study, I can schedule a meeting with the Hazardous Waste Staff of our department to fully discuss the requirements that will need to be met under each alternative in the FS.
- F3. Please note that, in addition to necessary permits for hazardous waste management activities, on-site discharge of wastewater would also require a VPDES permit.
- F4. The alternatives presented in the Feasibility Study appear to be TPH driven. It is questionable why this is the case when a risk assessment was not even performed for the TPH contamination. Additionally, during remediation, cleanup levels of all chemicals of concern must be met, not just one constituent.

- F5. Again, the conclusion regarding the lack of risk presented by subsurface soil, as well as the assumption that the subsurface is not a continuing source of contamination is questioned. If this is reevaluated, remedial alternatives for the subsurface will have to be addressed in the subsurface.
- F6. On page 10-3, it is stated that in the RI, six study areas were evaluated. Only five study areas were evaluated.
- F7. Regarding the table of ARARS in Appendix J, several are missing. The Virginia Hazardous Waste Management Regulations and Virginia Solid Waste Management Regulations will be applicable to the remedial activity. The RCRA Land Disposal Regulations will also be applicable. I have attached a list of other Commonwealth of Virginia ARARs for your reference.
- F8. Please provide the rationale for the statements on page J-3 that the QADSY is not within a floodplain, is not within the coastal zone, and is not within an area affecting a recreational river (the Elizabeth River.)